IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Frederic MALET et al. Examiner: Ana Lucrecia Woodward

Serial No.: 10/690,824 Group Art Unit: 1711

Filed: October 23, 2003

For: TRANSPARENT COPOLYMERS HAVING POLYAMIDE BLOCKS AND POLYETHER BLOCKS

APPEAL BRIEF

Mail Stop: AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Further to the Notice of Appeal filed on January 9, 2008, please consider the following.

The Appeal Brief fee of $ 510.00 is filed/paid herewith. The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

(i) REAL PARTY IN INTEREST

The present application is owned by Arkema, successor by means of a name change to Atofina, to whom the present application is assigned.

(ii) RELATED APPEALS AND INTERFERENCES

There are no known related appeals or interferences.

(iii) STATUS OF CLAIMS

Claims 1-14 are currently pending, are all rejected, and are all on appeal.

(iv) STATUS OF AMENDMENTS

No amendments have been presented subsequent to Final Rejection.

(v) SUMMARY OF CLAIMED SUBJECT MATTER

Appellants' invention is directed to a copolymer having polyamide blocks and polyether blocks, in which:

- the polyether blocks essentially consist of PTMG having a number-average molar mass M_n, of 200 to 4000 g/mol;
- the polyamide blocks are formed from a linear (noncyclic, nonbranched) aliphatic predominantly semicrystalline monomer and from a sufficient amount of at least one comonomer to reduce the crystallinity of the polyamide blocks, while remaining immiscible with the polyether amorphous blocks; and
- the shore D hardness is 20 to 70, and in which the copolymer is prepared by a process comprising reacting polyamide blocks having carboxylic end groups with a polyetherdiol.

See page 3, lines 11-19, and page 4, lines 1-13.

(vi) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following grounds of rejection are presented for review:

1. Rejection of claims 1-5 and 9-14 under 35 U.S.C. 102(b) or 103.
2. Rejection of claims 1, 2, 5 and 8-14 under 35 U.S.C. 102(b) or 103.
3. Rejection of claims 1-14 under 35 U.S.C. 103.

(vii) ARGUMENT

A. Rejection of claims 1-5 and 9-14 under 35 U.S.C. 102(b)/103 over Foy '786

Claims 1-5 and 9-14 have been rejected under 35 U.S.C. 102(b) or, in the alternative, 103 over U.S. Patent 4,331,786 (Foy et al.) Foy discloses a polyether-ester-amide block copolymer, prepared by condensation of a dicarboxylic polyamide with a polyoxyalkylene glycol. See, for example, column 1, lines 16-28. Patentees teach that the polyamides, having dircarboxylic chain ends, are obtained by, e.g., polycondensation of a lactam or polycondensation of an amino acid or of a diacid and diamine, "carried out in the presence of an excess of an organic diacid, the carboxylic groups of which are preferably located at the ends of the hydrocarbon chain." Patentees teach that the carboxylic acids thus used are fixed during the polycondensation action to the ends of the chain, allowing an alpha-omega-dicarboxylic polyamide to be obtained. See

column 4, line 3 through 17. It is thus clear that the patent fails to suggest, much less to anticipate, the present claims.

Foy fails to anticipate or suggest the present claims, inasmuch as the disclosure results in the production of homopolyamide blocks, and not copolyamide blocks. The diacids disclosed, for example at column 4, are employed in a way such that they are chain-stoppers rather than comonomers. For example, rather than disclosing preparation of a polyamide block from a predominately semicrystalline monomer *and* a co-monomer reducing crystallinity, i.e., producing a polyamide block of the formula X-A-B-B-A-B-A-X, in which A is a monomer and B is a monomer different from A and X is a chain limiting end stopper, Foy discloses a polyamide block of the formula X-A-A-A-A-A-X wherein A is a monomer such as an amino acid or a lactam, and X is an end stopper. Although there may be overlap between the monomers of Foy and those used presently, it is clear that a comonomer is not employed.

However, the Final Rejection argues, at page 3, that copolyamide blocks are not recited in the rejected claims. Applicants respectfully, albeit vehemently, disagree with this analysis. It is well known among polymer chemists that the term "comonomer" is only used specifically when associated with a first type of monomer and a *different*, second type of monomer. Note that the present claims recite production of polyamide blocks from a predominantly semicrystalline monomer and "at least one comonomer" in sufficient amount to reduce the crystallinity of the polyamide block. If the *same* monomer was used in both instances, on the one hand, this would be counter to the well established use of the term "comonomer" and, second, it is not seen that such would modify the crystallinity of the polyamide block already made of the same monomer. Thus, the claim language clearly recites two different monomers in the polyamide block which, in conventional usage of the term, would constitute a "copolyamide." Such is simply the well documented understanding in the art, and not, as suggested at page 3 of the Final Rejection, an attempt to read limitations in from the specification into the claims.

Claim 5

It is further respectfully submitted that additional basis for patentability exists for claim 5, in which the comonomer introduced to reduce the crystallinity is a lactam, an alpha, omega aminocarboxylic acid or a cyclic diamine associated with the diacid. Where monomers such as lactams, alpha, omega aminocarboxylic acids, etc. are arguably employed in Foy, these are monomers used in a condensation resulting in a homopolymer, and not employed in conjunction with a comonomer. Thus, claim 5 is not met even if 11-amino-undecanoic acid, etc., is employed.

B. Rejection of Claims 1, 2, 5 and 8-14 under 35 U.S.C. 102(b)/103

Claims 1, 2, 5 and 8-14 have been rejected under 35 U.S.C. 102(b) or, in the alternative 103 over U.S. Patent 6,300,463 (Figuly et al.). As with Foy, it is submitted that a correct interpretation of the present claims makes it manifestly evident that the reference fails to anticipate or suggest them. Figuly discloses elastomeric polymers containing polyether blocks and polyamide blocks, and the Final Rejection argues (see the sentence bridging pages 3 and 4 of the Office Action of December 13, 2006, relied upon in the Final Rejection), that the examples disclose polymers meeting the requirements of the claims. In fact, it is again submitted that the dicarboxylic acids disclosed in, for example, examples 2 and 3, function as chain stoppers just as in Foy, and are not comonomers with, e.g., the 11-aminoundecanoic acid of these examples. Thus, the products produced in this patent are of similar nature to those discussed above in Foy. Accordingly, it is clear that ample basis to overturn this rejection also exists, and the same is respectfully requested.

C. Rejection of Claims 1-14 under 35 U.S.C. 103

Finally, claims 1-14 have been rejected under 35 U.S.C. 103 over CA 236,322 (Montanari et al.). In the Office Action preceeding the Final Rejection, it was admitted, at page 5, that the disclosure of this reference does not teach the combination of semi-crystalline monomer and a co-monomer which lowers the crystallinity thereof. It is argued, however, that it would be obvious to use both such materials, but no reasons for such modifications are given in the prior Office Action. The Final Rejection, at page 3, argues that Montanari teaches the production of "copolyamide" blocks due to their disclosure of a "second type" and "third type" of polyamide. Regardless, Montanari does not suggest a (PEBA) copolymer of present invention with parameters:

- comprising polyether blocks made "essentially" of PTMG (for example, a minimum 95% by weight of the PE blocks being PTMG; see the specification page 8, lines 10-13);
- and polyamide blocks made of a "predominant" semi-crystalline monomer (for example, minimum 55% by weight of the polyamide blocks, see the specification page 7, lines 12-15) with a sufficient amount of at least one comonomer to reduce the crystallinity of the polyamide blocks, while

remaining immiscible with the polyether blocks,

- having a shore hardness of 20 to 70, and
- being prepared by reacting polyamide blocks having carboxylic and groups with a polyetherdiol.

Montanari refers to a transparent composition consisting of a blend:

- of semicristalline PA,
- of an amorphous PA containing units which are aromatic diacid residues,
- of a supple PA containing PA blocks and PE blocks (PEBA) and
- of compatibilizers for the semi-crystalline PA and for the amorphous PA.

Montanari does not indicate that the PEBA itself is a transparent copolymer. Indeed, the PEBA of Montanari needs at least to be blended with an amorphous PA to obtain a transparent composition (see Montanari US description column 9, lines 5-7). Montanari does not suggest reducing the crystallinity of the PA blocks of a PEBA, in order to obtain a transparent PEBA, nor adjusting any ratio between a monomer and a comonomer of the polyamide blocks of a PEBA in order to obtain a transparent PEBA copolymer. Thus, Montanari simply fails to suggest the presently claimed materials. Ample basis to overturn this rejection also exists, and the same is respectfully requested.

All claims are submitted to be allowable, and removal of all rejections of record is respectfully requested.

Respectfully submitted,

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(viii) CLAIMS APPENDIX

1. A copolymer having polyamide blocks and polyether blocks, in which:

- the polyether blocks essentially consist of PTMG having a number-average molar mass M_n, of 200 to 4000 glmol;
- the polyamide blocks are formed from a linear (noncyclic, nonbranched) aliphatic predominantly semicrystalline monomer and from a sufficient amount of at least one comonomer to reduce the crystallinity of the polyamide blocks, while remaining immiscible with the polyether amorphous blocks; and
- the shore D hardness is 20 to 70, and in which the copolymer is prepared by a process comprising reacting polyamide blocks having carboxylic end groups with a polyetherdiol.

2. The copolymer as claimed in claim 1, in which the predominantly semicrystalline monomer is 11-aminoundecanoic acid or lauryllactam.

3. The copolymer as claimed in claim 1, in which the predominantly semicrystalline monomer is a diamine associated with a diacid, both these being aliphatic and linear.

4. The copolymer as claimed in claim 3, in which the aliphatic diamine has 6 to 12 carbon atoms and the aliphatic diacid has 9 to 12 carbon atoms.

5. The copolymer as claimed in claim 1, in which the comonomer introduced in order to reduce the crystallinity is a lactam, an alpha, omega-aminocarboxylic acid or a cyclic diamine associated with a diacid.

6. The copolymer as claimed in claim 1, in which the polyamide blocks are formed from lactam 12 (predominantly crystalline) and IPD 10 (isophorone diamine and sebacic acid).

7. The copolymer as claimed in claim 1, in which the polyamide blocks are formed from lactam 12 (predominantly crystalline) and from PACM 12 (PACM 20 and C_{12}

diacid).

8. The copolymer as claimed in claim 1, in which the polyamide blocks are formed from lactam 12 (predominantly crystalline) and either lactam 6 or 11-amino-undecanoic acid or lactam 6 and 11-amino-undecanoic acid.

9. The copolymer as claimed in claim 1, in which the predominantly semicrystalline monomer represents at least 55% by weight of the constituents of the polyamide blocks.

10. The copolymer as claimed in claim 1, in which the amount of polyether blocks is 10 to 40% by weight of the copolymer.

11. The copolymer as claimed in claim 1, in which the mass M_n, of the polyether blocks is between 300 to 1100.

12. The copolymer as claimed in claim 1, in which the Shore D hardness is 40 to 70.

13. An article manufactured with the copolymers as claimed in claim 1.

14. The copolymer as claimed in claim 1, in which the predominantly semicrystalline monomer represents at least 70% by weight of the constituents of the polyamide blocks.

(ix) EVIDENCE APPENDIX

None

(x) RELATED PROCEEDINGS APPENDIX

None